2020

EFFECTS OF SENTENCE-COMBINING INSTRUCTION FOR SPANISH-SPEAKING LANGUAGE-MINORITY STUDENTS: Evidence From Two Single-Case Experiments

J. Marc Goodrich

Michael Hebert

Mackenzie E. Savaiano

Tim Andress

EFFECTS OF SENTENCE-COMBINING INSTRUCTION FOR SPANISH-SPEAKING LANGUAGE-MINORITY STUDENTS

Evidence From Two Single-Case Experiments

ABSTRACT

Research indicates that sentence-combining instruction is effective for improving writing outcomes; however, no studies to date have examined the effects of sentence-combining instruction on the writing skills of Spanish-speaking language-minority (LM) students. Therefore, the purpose of this study was to examine the effects of explicit sentence-combining instruction that focused on correct adjective use when used with Spanish-speaking LM students with poor sentence construction skills. Across two studies, seven Spanish-speaking LM children in third to fifth grade participated in sentence-combining interventions designed to teach adjective placement. Results indicated that there was a functional relation between the introduction of sentence-combining instruction and student performance on sentence-writing probes. In addition, the intervention led to an improvement in number of correct writing sequences on the sentence-writing probe.

J. Marc Goodrich
Michael Hebert
Mackenzie Savaiano
Tim T. Andress
UNIVERSITY OF NEBRASKA–LINCOLN

STUDENTS who speak a language other than English at home in the United States are often referred to as language-minority (LM) students. The largest group of LM students in the United States are students who speak Spanish at home. According to the US Census Bureau (2017; Bauman,

THE ELEMENTARY SCHOOL JOURNAL
Volume 120, Number 4. Published online June 1, 2020
 0013-5984/2020/12004-0007$10.00

2017), Hispanic/Latino students comprise approximately 25% of school-age children, and approximately 72% of the Hispanic/Latino population speaks Spanish at home. LM students often have lower levels of proficiency in English when they enter school than do their monolingual English-speaking peers (e.g., Hoff, 2013; Kieffer, 2008). These differences emerge for several reasons, including relative quantity of input in the first (L1) and second (L2) language, as well as socioeconomic differences between LM and monolingual children in the United States (Aud et al., 2010). Children's developing oral language skills are important predictors of later reading and writing development (e.g., Shanahan, 2006; Storch & Whitehurst, 2002). Consequently, LM students who have limited oral English proficiency face significant challenges in acquiring English reading and writing skills (August et al., 2005; Kieffer, 2011). Indeed, data from the National Assessment of Educational Progress indicate that LM students identified as English-language learners score significantly lower on measures of writing than do their monolingual peers (National Center for Education Statistics, 2011). Consequently, high-quality instruction is needed to improve Spanish-speaking LM students' writing skills and prevent them from falling behind their peers. Therefore, the purpose of this study was to evaluate the efficacy of a sentence-writing intervention when used with Spanish-speaking LM students.

LM Students and Writing

The specific primary language of LM students may have unique impacts on their English writing skills. Spanish-speaking LM students with limited English proficiency may struggle with English spelling, word choice, and grammar (e.g., sentence structure, article use, pronoun use) because of differences in conventions of phonology and syntax across Spanish and English (e.g., Escamilla, 2006). For example, sentence structure differs across Spanish and English (e.g., in Spanish, adjectives often follow the noun; pronouns are not always required), and LM students may inappropriately apply conventions of Spanish sentence structure when writing in English. Furthermore, differences in language skills across monolingual and LM students may manifest as differences in writing skills. In fact, some evidence indicates that LM students utilize adjectives about half as frequently as do their monolingual peers in writing (Huie & Yahya, 2011). In addition, although there is substantial overlap between letters in the Spanish and English alphabet, Spanish has a much shallower orthography than does English, and letters that are the same across Spanish and English (in particular, vowels) often correspond to different sounds across languages (e.g., the letter *i* in Spanish corresponds to the English long *e* sound). Because of this, Spanish-speaking LM students may apply rules of Spanish phonology when writing in English (Figueredo, 2006), potentially leading to larger numbers of spelling errors than may be seen in monolingual English-speaking students' writing samples. Consequently, it may be important for writing instruction to teach adjective placement in English writing to LM children while simultaneously providing supports that help students reduce the number of spelling errors in writing.

A few studies have evaluated the effects of writing interventions designed to address LM students' specific writing difficulties, albeit with mixed results. Prater and

Bermudez (1993) conducted a writing intervention in which LM students either used peer discussion to examine quality of student writing or received teacher feedback in which spelling and grammatical errors were marked on student writing samples. Although no effects of the treatment emerged for overall writing quality, there were significant effects on the number of words and ideas written in favor of the peer-discussion group.

Another study compared the effects of structured writing instruction to the effects of free writing instruction (Gomez et al., 1996). In structured writing instruction, students practiced specific writing skills and received explicit feedback to correct errors (analogous to the teacher feedback from Prater and Bermudez [1993]), whereas in free writing instruction, students chose their topic for writing and received comments on global writing quality (analogous to the peer discussion of writing quality from Prater and Bermudez [1993]). Results generally indicated there were no differences across the structured and free writing groups, as significant differences emerged on only one of nine writing outcomes (percentage of correct writing sequences). Methodological limitations of the Gomez et al. (1996) study further preclude strong conclusions from being drawn regarding the effectiveness of various writing instruction programs for LM students. A potential explanation of the mixed results across prior studies may be that the interventions did not specifically target skill instruction addressing impacts of the primary language on students' English writing. Although peer and explicit feedback are evidence-based practices for improving writing instruction (Graham et al., 2011), it is not possible for such feedback to target primary-language-influenced errors in a systematic and consistent way. That is, feedback is dependent on the content generated by students in previous drafts of their writing, which may or may not contain such errors.

In a more recent study, direct English writing instruction was reported to increase the total number of words written and correct word sequences used among Spanish-speaking LM students (Viel-Ruma et al., 2010). However, the description of the instruction indicated that the researchers used a packaged curriculum (i.e., Expressive Writing) and did not indicate which specific skills were addressed within the study. This problem notwithstanding, direct instruction techniques employed by Viel-Ruma et al. (2010) could potentially be used to provide more instruction targeting primary-language-influenced skills, although the authors did not design the instruction for this purpose. It is possible that pairing direct instruction with an evidence-based practice for targeting specific writing skills aimed at primary-language influences on writing will lead to stronger effects for LM students.

Sentence-Combining Instruction

One approach to direct writing instruction that shows substantial evidence of effectiveness is sentence combining. In its simplest form, sentence-combining instruction can be used to explicitly teach students to manipulate the syntax of sentences to write clear and grammatically correct sentences of different types (e.g., simple, compound, complex; Saddler et al., 2018). This is accomplished by teaching students to consolidate information from two or more kernel sentences (i.e., simple sentences

with no modifiers that can be combined) into a single sentence, using all of the information and eliminating redundancies without changing the meaning of the text. For example, sentence-combining instruction may require students to develop a compound predicate by combining two kernel sentences (*The girl is tall. The girl is strong.*) into one sentence (*The girl is tall and strong.*). Sentence-combining instruction can be used to teach a number of specific syntactic skills, including compound subject and object use, adjective and adverb use, and compound sentences (e.g., Saddler, Behforooz, & Asaro, 2008). In a meta-analysis of writing instruction methods for adolescent students, Graham and Perin (2007) reported that sentence-combining instruction was an effective intervention for improving writing quality. Specifically, in a study of fourth-grade students with writing difficulties, sentence-combining instruction produced an increase in students' story writing quality and sentence construction abilities (Saddler, Behforooz, et al., 2008). In addition, significant effects of sentence combining have been documented for different age groups and other academic outcomes, such as reading fluency (Graham & Hebert, 2011).

According to Saddler (2007), sentence combining is effective because it can be used to teach students the syntactic choices available to them when writing and free up cognitive resources to attend to higher-level functions of the writing process. Therefore, sentence combining may be particularly effective for LM students because it involves explicitly teaching rules of English syntax. Because writing is dependent on oral language (Shanahan, 2006), LM students still learning oral English language conventions may produce less syntactically complex sentences than their peers, with more grammatical errors (Perin et al., 2017). Even LM students who have strong oral English skills may have difficulty utilizing those skills in writing, as the syntax of writing is more formal than that of oral language. However, as previously noted, kernel sentences for sentence-combining exercises can be developed to foster more complex sentence writing, showing the syntactic choices available when writing in English.

LM students also may have to devote considerable cognitive resources to using the correct English grammatical structure of sentences when writing, leaving fewer cognitive resources available for generating text (Saddler & Graham, 2005). According to the simple view of writing (Berninger et al., 2002), text generation is dependent on transcription skills and executive functions, both of which are constrained by working memory resources. Therefore, if LM students need to devote more working memory resources to transcription skills (such as sentence-level grammar), fewer resources are available for higher-order writing tasks. Similarly, the cascading levels of language framework (Berninger et al., 2015) posits that written language skills are, in part, dependent on children's level of oral language proficiency and reading skills. Improving the sentence-writing skills of LM students would allow these students to free up the cognitive resources necessary for generating and organizing their ideas, including drawing on their oral language skills to support overall writing quality.

Sentence-combining instruction also reduces the cognitive load on writers during instruction, which can help teachers focus the attention of LM students on specific skills. Students with learning difficulties often struggle with sentence construction, and many of these students have limited cognitive resources on which to draw when writing (Graham, 1997; Maehler & Schuchardt, 2016). Sentence-combining exercises

provide students with kernel sentences that include ideas, words with correct spelling, and vocabulary. Thus, instead of focusing on these aspects of the writing process, the attention of LM students can be directed to focus on grammar and syntax. Moreover, teachers can develop exercises to focus on any specific grammatical or syntactic structure they would like to emphasize. In other words, teachers can design exercises that specifically address the influence of the primary language on English writing. For example, one might develop exercises to teach Spanish speakers how to write sentences using adjectives, which often follow nouns in Spanish but precede nouns in English.

Prior research has demonstrated the effectiveness of sentence-combining instruction when used in a peer-mediated context (e.g., Saddler, Asaro, & Behforooz, 2008; Saddler, Behforooz, et al., 2008; Saddler & Graham, 2005). Specifically, in previous studies for which less skilled writers were paired with more skilled writers, sentence-combining instruction yielded significant, positive effects for students' sentence construction skills, as well as story writing and revision skills. Pairing low-performing students with high-performing students provides a model for low-performing students and additional opportunities for feedback. Thus, peer-mediated sentence-combining instruction may have a greater impact on student writing abilities than does instructor-delivered sentence-combining instruction alone, especially for LM students who may have limited levels of oral English proficiency to support their English writing.

Current Study

The purpose of this project was to identify the potential for sentence-combining instruction that targets specific influences of LM students' primary language for improving writing outcomes among elementary-age LM students. To do so, two multiple-probe designs (one with one-to-one instruction [Study 1], one with dyad instruction [Study 2]) were used to investigate the effects of sentence-combining instruction for seven Spanish-speaking LM students in third, fourth, and fifth grades who demonstrated English writing difficulties. We specifically selected students in third, fourth, and fifth grades because students in the later elementary grades have had greater exposure to writing instruction than have younger students. Writing difficulties in the later elementary years may be more reliable than are writing difficulties in the early elementary years that may be due to limited exposure to structured writing instruction, especially for LM children who may have had limited English proficiency early in elementary school, preventing access to early writing instruction. In addition, sentence-combining studies identified and included in meta-analyses have shown it is effective for students in grades 3 and above, but have not identified studies with students lower than grade 3 (e.g., Graham & Hebert, 2010; Graham & Perin, 2007; Rogers & Graham, 2008); thus, we have a stronger basis for our expectation that this instruction may be effective at these grade levels than earlier grade levels.

Because Spanish-speaking LM students may have difficulties with aspects of writing at the word and sentence levels, we developed a sentence-combining intervention that focused on correct use of adjectives and adverbs to address the low writing skills of these students. Adjectives and adverbs that represented general academic

vocabulary relevant across content areas were selected as target words to be taught in the intervention. Because our focus was solely on using adjectives and adverbs, we did not teach use of more complex syntactic structures within this study. Based on prior research demonstrating the effectiveness of sentence-combining instruction for monolingual children (e.g., Graham & Perin, 2007), providing explicit sentence-combining instruction to LM students using concrete examples of correct adjective and adverb use should result in direct improvements in LM children's adjective and adverb use in writing.

Two research questions were addressed in these studies. First, we examined the effectiveness of sentence-combining instruction on the sentence-writing skills of Spanish-speaking LM students. It was hypothesized that introduction of sentence-combining instruction would lead to immediate increases in correct response rate on sentence-combining probes, and that these effects would be maintained after students transitioned out of the instructional phase. Second, we examined whether effects of sentence-combining instruction generalized to other curriculum-based measurements, such as students' correct writing sequences on sentence-combining and passage-writing probes (i.e., measures of "near transfer"). It was expected that exposure to explicit sentence-combining instruction would be associated with increases in percentage of correct word sequences on sentence-combining probes. We considered this a measure of near transfer as it simply represented an alternate scoring approach for the sentence-writing probes, which were directly targeted by the intervention.

In addition to the two primary research questions, an exploratory aim of this study was to examine whether our sentence-writing intervention led to improvements in scores on norm-referenced writing assessments (i.e., measures of "far transfer") and whether students' knowledge of the target vocabulary words included in the intervention increased. We expected that, following the intervention, students would have higher scores on norm-referenced writing measures as well as greater knowledge of target vocabulary words. Norm-referenced writing assessments were considered measures of far transfer because they were not directly targeted by the intervention. However, it should be noted that the multiple-probe designs used in this project do not allow for causal inference regarding whether improvement on standardized writing measures and increases in target vocabulary knowledge were due to the intervention.

All materials, methods, design, and procedures were identical between Study 1 and Study 2. The only difference between Study 1 and Study 2 were the individual participants, and the fact that participants were instructed in a dyad setting in Study 2 (rather than the one-to-one setting used for Study 1; an artifact of the recruitment and screening process, described later). Consequently, Study 2 represents a replication of Study 1, rather than a unique project addressing separate research questions.

Study 1: Method

Participants and Setting

Participants were recruited for this study (and for Study 2) from an after-school university reading center as well as from elementary schools in a medium-sized Midwestern city. Flyers and consent forms were sent home with eligible children

at the university center and local schools indicating the opportunity to enroll in an intervention study to improve the writing skills of Spanish-speaking students in third through fifth grade. For many participating students, children attended after-school instructional sessions at the university to complete the intervention. However, one school in the local school district partnered with us on this project. Any students enrolled in the project who attended that school received instruction after school hours at their normal school facility.

Three Spanish-speaking LM students in third and fourth grade participated in this study, two of whom completed the intervention at the university and one of whom completed the intervention at their normal school facility. All three students demonstrated low performance on the sentence-combining probe that was used as a screener for inclusion in this study (see Experimental Design section). For two students, parent report indicated that Spanish was spoken at home between 76% and 100% of the time. For the remaining student, parent report indicated that Spanish was spoken at home between 51% and 75% of the time. However, for two of the three students, parents reported that their child preferred to speak English. All students came from low socioeconomic backgrounds, as all parents reported their child was eligible to receive free or reduced-price lunch.

Measures

Prior to beginning the intervention and immediately following the intervention, students completed one standardized measure of writing skills as well as a measure of knowledge of the target vocabulary words to be used in the intervention. During the three phases of the intervention (i.e., baseline, intervention, and maintenance), students completed a sentence-combining probe and a passage-writing probe during each session.

Sentence Writing. As a measure of sentence writing, students completed the sentence combining subtest of the Test of Written Language, Fourth Edition (TOWL-4; Hammil & Larson, 2009). This assessment contained 23 items that required children to combine two or more short sentences into one longer sentence. For example, children were asked to combine *The girl is tall* and *The girl is fast* into *The girl is fast and tall*. All items were scored as correct or incorrect. Items were presented to students in order of increasing difficulty. To receive a score of correct, students were required to correctly combine the sentences and include all of the information from the kernel sentences. Children were stopped after missing three consecutive items. To account for the potential of testing effects, children completed Form A at pretest and Form B at posttest. Internal consistency reliability for this measure ranges from .85 to .88 for third- to fifth-grade children.

Passage Writing. As a measure of passage-writing skills, children completed the essay composition subtest of the Wechsler Individual Achievement Test—Third Edition (WIAT-III; Psychological Corporation, 2009). For this subtest, children are given an open-ended prompt (i.e., *What is your favorite game? Include at least 3 reasons why you like it*.) and allowed to write for 10 min. Trained research assistants coded passages for specific features, such as an introductory sentence, supporting reasons, transition words, and a concluding sentence. Interrater reliability for the WIAT-III for third- through fifth-grade students ranges from .86 to .87 (Breaux, 2010).

Target Vocabulary Knowledge. Children completed an experimenter-developed vocabulary test that measured students' knowledge of vocabulary words taught as part of the intervention. For this assessment, children were required to match 20 target vocabulary words to their definitions. Adjectives were selected from lists of general academic vocabulary that is not content-specific (e.g., "translucent," "rigid"). Definitions for target words were developed from *Merriam-Webster's Learner's Dictionary* (n.d.-a).

Sentence-Combining Probe. During each baseline, intervention, and maintenance session, students completed a sentence-writing probe independently. Each sentence-combining probe was developed as part of this intervention and contained 10 sets of two or three kernel sentences to combine. Seven items on each probe required students to combine two kernel sentences into one sentence and three items on each probe required students to combine three kernel sentences into one sentence. Each probe contained one example of each target vocabulary word for the corresponding lesson. All items were scored as correct or incorrect. To receive a score of correct, students were required to correctly combine the sentences (i.e., have appropriate adjective placement as well as correct grammar throughout the sentence) and include all of the information from the kernel sentences.

We also used percentage of correct word sequences as an outcome measure for the study. Two raters scored sentence-combining probes for correct writing sequences, a commonly used curriculum-based measurement metric (see Datchuk et al., 2019, for a review). A correct writing sequence consists of two consecutive words (or one word and one other writing feature [e.g., punctuation]) that are spelled correctly and are syntactically and semantically correct in the context of the sentence. Correct word sequences scoring method has been shown to be reliable (Gansle et al., 2002; McMaster et al., 2009) and valid (McMaster et al., 2009; Romig et al., 2017). We converted correct word sequence scores to the overall percentage of correct writing sequences to control for any differences in the number of words (and subsequent number of potential correct word sequences) in kernel sentences across probes.

Passage-Writing Probe. Following completion of the sentence-writing probe, students were asked to write everything they could about the animal that was the focus of that day's lesson or sentence-combining probe. Students were given the opportunity to write for 5 min. Two raters scored each passage-writing probe for correct writing sequences. Across all student passages, interrater agreement for correct writing sequences was .94.

Scoring Procedures

Three student research assistants working on this project were responsible for scoring all sentence-combining and passage-writing probes. All students responsible for scoring writing data attended a training session in which they learned about the scoring procedures for the sentence-combining and passage-writing probes, as well as procedures for scoring correct word sequences. During this training session, students were given writing samples to practice scoring. All students were required to exceed 90% reliability in scoring on practice writing samples prior to scoring writing samples for the project. Interrater reliability was computed as the percentage of

agreement between two raters (i.e., number of agreements divided by total number of agreements and disagreements).

Materials

The authors developed a series of sentence-combining exercises around animals and habitat themes (see the Appendix for a sample student worksheet). Four animal habitats were selected (i.e., ocean, rain forest, tundra, savanna), and five specific animal topics were chosen for development within each habitat theme for a total of 20 topics. Topics were all animals (e.g., sea turtles), which were of high interest to students. Across the topics, 20 adjectives were chosen to be target vocabulary words for the intervention. These words were the same words used in the target vocabulary knowledge measure. To develop specific sentence-combining exercises, graduate research assistants compiled facts about the animals used in lessons from various sources. Then, these students broke the facts up into sets of either two or three kernel sentences that required correct adjective placement to combine. In the development of the exercises for the intervention, three of the target words were used in each lesson, and each of the target words was used a total of three times across the lessons. All other adjectives within and across lessons were allowed to vary with the content. The three target adjectives were chosen to describe (1) physical characteristics of the animal, (2) the animal's habitat, and (3) the food the animal eats. Adjectives that represented general academic vocabulary, rather than content-specific vocabulary, were chosen to ensure that words were maximally relevant to students' experiences.

Once adjectives were selected, definitions were generated from two sources: *Merriam-Webster's Word Central* (Meriam-Webster, n.d.-b) and the *Merriam-Webster Learner's Dictionary* (Merriam-Webster, n.d.-a). *Word Central* is a student dictionary that provides short, simple definitions. The *Learner's Dictionary* was created for students learning English as a second or foreign language, and it provides clear, illustrative definitions. Between these two sources, definitions were selected and/or revised to be clear and concise. In addition, Spanish translations of all target vocabulary words were chosen by a graduate student who is a native Spanish speaker, to capitalize on potential word knowledge that children had in their first language when learning English vocabulary.

Once adjectives and definitions were finalized, sentences were created for the sentence-combining instruction. Sentences were created to be factually accurate and include adjectives to be combined across the sentence kernels. For each lesson, 3 sets of kernel sentences were written to be modeled by the instructor, 3 sets of sentences were written to be completed by the instructor and student together (guided practice), and 10 sets of sentences were written to be completed by the student independently (sentence-writing probe). Thus, each lesson contained a total of 16 sets of sentences. Each target vocabulary word was used twice within a given lesson: once during teacher modeling and once in the sentence-writing probe.

Experimental Design

Student performance on the sentence-combining probe was used as a screener for inclusion in the study. If students consistently scored at or above the criterion

established for transitioning from instruction to maintenance (i.e., 8 out of 10 items correct on the sentence-combining probe), they were not eligible for inclusion in this study. The multiple-probe design is similar to a multiple-baseline design with the exception that students complete probes intermittently, rather than continuous measurement being done of skills at baseline (Horner & Baer, 1978). During the baseline phase, each student completed at least five sentence-combining probes. More than five sentence-combining probes were completed if additional probes were needed to establish a stable baseline trend. Following establishment of a stable baseline trend for the first student in each study, the intervention phase began. Students remained in the intervention phase until they demonstrated at least 80% mastery of the sentence-combining probe for three different lessons, at which point students transitioned to the maintenance phase and the intervention phase began for the next student. Across all phases, the intervention lasted 7.5 weeks; however, because of the intermittent nature of probes completed for the multiple-probe design, participating students completed 14 probes on average (the equivalent of 3.5 weeks of instruction).

Intervention Procedure

Following return of consent forms, participants completed pretest assessments of writing skills (TOWL sentence combining, WIAT-III essay composition) and knowledge of target vocabulary words. All baseline, intervention, and maintenance sessions were delivered by trained undergraduate and graduate research assistants either in a university lab setting or in a classroom at the children's school after normal school hours. During baseline and maintenance sessions, students completed writing probes but did not receive any type of instruction. Instructional procedures for intervention sessions are described in the following text.

Prior to the implementation of the intervention, habitats were randomly assigned for each student to ensure that the order of the lessons did not affect the instruction. For example, one student may have received the ocean habitat first whereas another student may have received the desert habitat first. Furthermore, within each habitat, the order of animal topics was also randomly assigned. Therefore, when reading about ocean animals, one student might be introduced to sea turtles first whereas another student might be introduced to jellyfish first. This random assignment was used to ensure that there were no sequencing effects across animals or habitats.

During each lesson, the exercises followed a 2, 2, 3 sequence for the number of kernel sentences included in the exercises for modeled and guided practice. See the Appendix for a sample teacher script. For each lesson, the instructor began the lesson by explaining the goal and introducing the students to the three content-specific target adjectives, which included a definition, sample sentence, and Spanish translation. The target adjectives then appeared once each during modeled exercises and once each during independent exercises across three different lessons. Consequently, each target adjective was used in six different exercises throughout the intervention. The instructor modeled three sentence-combining exercises using the target words for the lesson. During modeling, the instructor used think-alouds to explain their thought process as they successfully combined the sentences. For example, to combine the kernel sentences, "Sea turtles eat jellyfish. Jellyfish are translucent.," the

instructor modeled identification of the target adjective, circled the adjective, and then drew an arrow from the second kernel sentence to the first to indicate where the adjective should be placed and described how to write the new sentence to the student.

To keep students engaged during modeling, students were expected to follow along as the instructor read the sentences, point to words when instructed, and write target adjectives in blank spaces provided in the sentences. When writing the final combined sentence, four main skills were emphasized by the instructor across lessons. These included sounding out the word, rechecking spelling by looking back at the previous sentence, ensuring all of the information from the kernel sentences was included in the final combined sentence, and using commas correctly when using more than one adjective to describe the same noun.

After successfully completing the modeling portion of the lesson, students then moved on to the guided practice portion of the lesson. Students and instructors did echo reading of the kernel sentences and then students completed exercises with the teacher's guidance. When students were able to successfully combine the sentences independently, they received specific praise. An example of the praise may be, "That's correct! Sea turtles eat translucent jellyfish. 'Translucent' is the adjective used to describe the jellyfish." However, if students were unable to combine the sentence correctly, the instructor provided prompts to assist them in completing the example.

Guided practice was followed by independent practice that consisted of 10 exercises, which the students completed individually. The instructor provided support when and where it was necessary. The instructor read the directions from the teacher script before the students began. During this time, the instructor checked in with the student after the student completed two to three of the exercises to provide encouragement and motivation. After the students finished the independent practice exercises, the instructor checked student responses and provided praise and/or corrective feedback.

Fidelity of Implementation

Prior to implementation of the intervention, all instructors attended meetings in which the authors of the article modeled the instruction to be given. In addition, the instructors were given multiple opportunities to practice the instruction during this meeting and prior to implementation of instruction with participants. The instructors demonstrated accurate performance on teaching a lesson to the principal investigators prior to working directly with participants. To evaluate fidelity of implementation of the intervention, 25% of sessions for each phase within student were observed and coded by one of the first three authors of the article (i.e., for Student X, 25% of baseline sessions were observed, 25% of intervention sessions were observed, and 25% of maintenance sessions were observed). For baseline and maintenance sessions, a coding sheet was used to determine that the probe was administered to students but that no instruction occurred. For intervention sessions, a coding sheet was used to determine that the instructor properly introduced the lesson, reviewed target vocabulary words, modeled the first three exercises for the student, completed the following three exercises with the student (guided practice), and allowed the student

to complete the remaining sentence-combining and passage-writing probes independently. Across all coded sessions for both Study 1 and Study 2, instructors implemented 96.4% of components of the intervention accurately, indicating that the intervention was implemented with a high degree of fidelity.

Data Analysis

We used visual analysis to evaluate correct/incorrect responses on the sentence-writing probe (a proximal outcome and the primary outcome of interest in this study); this measure was used to determine phase changes and criterion decisions. Following the guidelines set forth by Kratochwill et al. (2013), we examined the data for each outcome in four steps. First, we evaluated whether there was a stable pattern of data during the baseline phase. Second, we examined within-phase patterns to determine whether there was consistency within each phase for each participant. Third, we compared the data from adjacent phases to determine whether introduction of the intervention resulted in improved performance on writing probes and whether any improvements carried over to the maintenance phase, during which students were no longer receiving the intervention. Fourth, we analyzed the data across participants to determine whether there were at least three demonstrations of an effect of the intervention on performance on writing probes. Consequently, we examined the data for patterns pertaining to level, trend, variability, immediacy of effect, overlap, and consistency across similar phases.

We also evaluated whether the intervention resulted in improvements to students' percentage of correct writing sequences on the sentence-combining probe (a measure of near transfer) by examining differences in mean student correct writing sequences across phases. Prior research indicates that percentage of correct writing sequences has stronger predictive validity for writing outcomes than do other curriculum-based measures, including among samples of LM students (e.g., Amato & Watkins, 2011; Keller-Margulis et al., 2015). In addition, we evaluated whether effects of the intervention generalized to percentage of correct writing sequences on the passage-writing probe (a measure of far transfer) using means and ranges in each phase of the intervention. Finally, as additional measures of far transfer we examined whether effects of the intervention extended to a standardized measure of sentence-combining skills and an assessment of specific vocabulary words taught as part of this intervention by examining pre- and posttest scores on these measures; however, we cannot make any causal inferences regarding these assessments, and we include them only to describe gains for individual students descriptively.

Study 1: Results

Results for the primary outcome of interest for Study 1, accuracy at completing the sentence-combining probe, are displayed in Figure 1. Baseline data were stable, with only one data point across all three students being above zero. This indicated that prior to instruction, students were unable to combine the sentences accurately. During baseline, students frequently combined sentences by either separating the kernel sentences with a comma or the word "and." However, some students did show

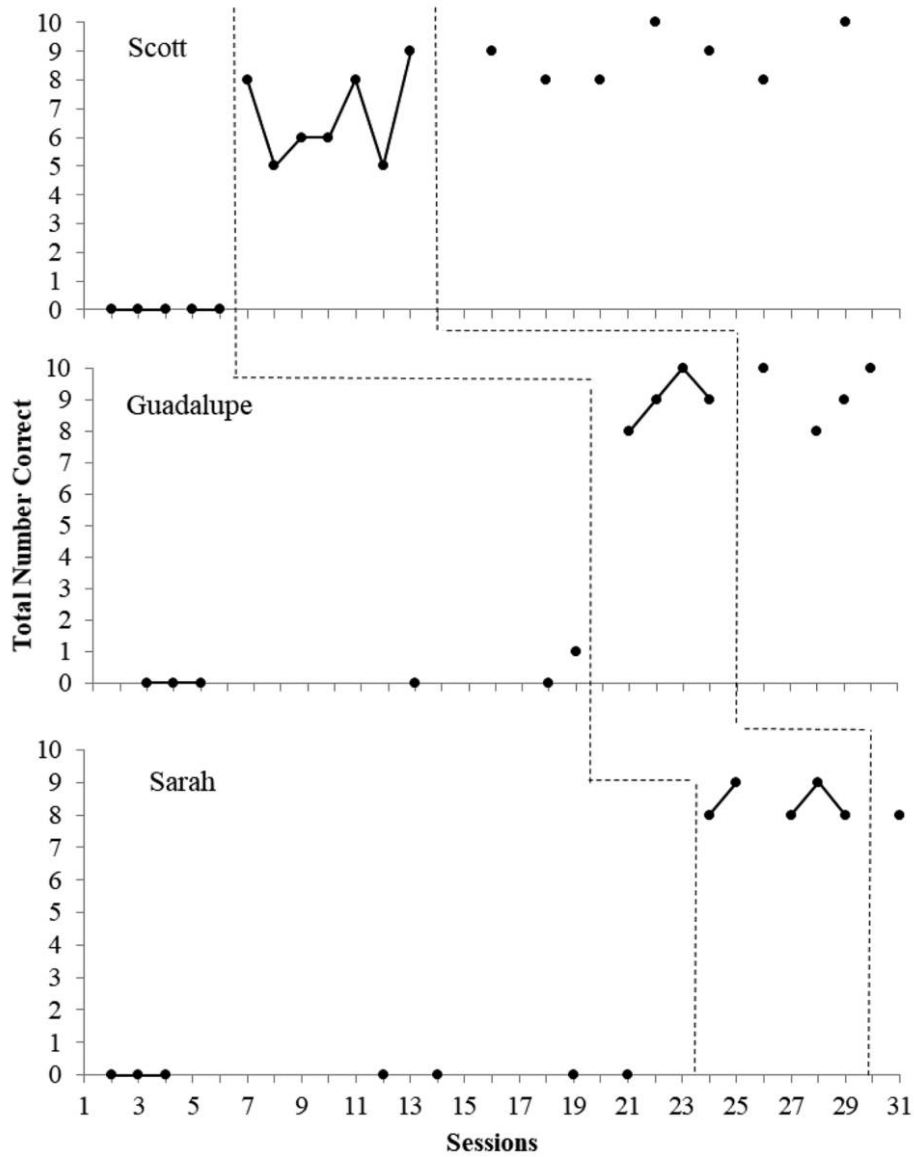


Figure 1. Student performance on sentence-combining probes (accuracy) during baseline, intervention, and maintenance phases for students in Study 1.

attempts to combine sentences by removing redundant information. For example, during the first baseline session prior to any explicit sentence-combining instruction, Guadalupe combined the kernel sentences:

To communicate, dolphins use their sonar. Their sonar is accurate.
by writing:
To communicate, dolphins use their sonar is a accrate.

As another example of an attempt to eliminate redundant information that resulted in incorrect adjective placement, Sarah attempted to combine the kernel sentences:

Male reindeer have antlers. Their antlers are broad. Male reindeer are solitary.
by writing:
male reindeer have antlers, broad, solitary.

In general, students showed clear, immediate improvement in their sentence-combining skills following introduction of the intervention. Figure 2 displays an example of student work. For this particular lesson, Sarah correctly completed 9 of 10 sentence-combining exercises. She was able to use strategies to identify the adjective that needed to be moved accurately, and she drew arrows to the corresponding noun the adjective should modify. Then, she was able to translate this strategy use to a correctly written sentence. Scott showed an immediate improvement in ability to combine sentences accurately, as indicated by the change in level upon introduction of the intervention (mean = 6.71, range = 5–9). However, Scott needed seven sessions of instruction prior to achieving the preestablished criteria of at least 8 out of

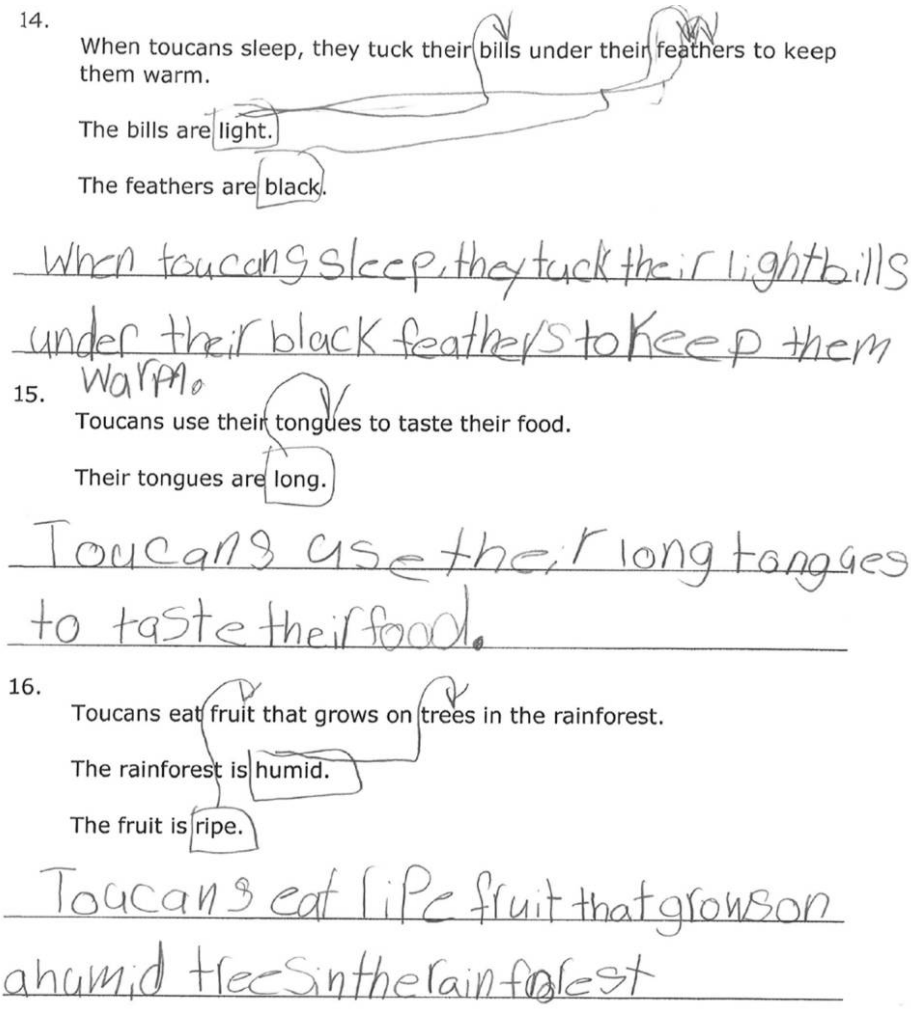


Figure 2. Student writing sample from sentence-combining probe immediately following instruction.

10 items correct on the sentence-combining probe. Upon transition to the maintenance phase, Scott's scores on the sentence-combining probe improved further (mean = 8.86, range = 8–10) and remained high throughout seven maintenance sessions. Similarly, Guadalupe demonstrated immediate improvement during the instructional phase (mean = 9.00, range = 8–10) that persisted after transition to the maintenance phase (mean = 9.25, range = 8–10). Finally, Sarah also demonstrated immediate improvement during the intervention phase (mean = 8.4, range = 8–9). There were not sufficient data to indicate whether gains Sarah made following introduction of the intervention persisted into the maintenance phase, although her single maintenance assessment was at the criterion. As measures of effect size, we computed the percentage of nonoverlapping data (PND), the percentage of all nonoverlapping data (PAND), and Tau-U. For Study 1, PND and PAND were both 100%, and Tau-U was 1.

As a measure of near transfer, we evaluated whether children's percentage of correct writing sequences on the sentence-combining probe improved following introduction of the intervention. Results for Study 1 are displayed in the upper panel of Table 1. For Scott, average score during the intervention phase represented an improvement over his scores during baseline, although the range of scores across baseline and intervention overlapped. Scott's scores during maintenance were even higher, though some overlap in range with baseline scores remained. For Guadalupe, initial level did not increase as substantially and the range of scores during intervention and baseline had significant overlap. However, no data during the maintenance phase overlapped with baseline. Sarah showed a large increase in mean correct writing sequences in the intervention phase when compared with baseline, with no overlap in the ranges of scores; however, there were not sufficient maintenance data to determine whether gains made upon introduction to the intervention were maintained once the intervention was removed.

For far transfer outcomes, results for the correct writing sequences on the passage-writing probe are displayed in Table 2. For students in Study 1 (see upper panel of Table 2), there were no clear increases in mean percentage of correct writing sequences from baseline to intervention. All students had substantial overlap in the

Table 1. Scores on Percentage of Correct Word Sequences for Sentence-Writing Probes

	Baseline *M* (Range)	Intervention *M* (Range)	Maintenance *M* (Range)
		Study 1	
Scott	52 (43–59)	66 (51–81)	71 (56–82)
Guadalupe	87 (85–91)	90 (82–97)	95 (94–97)
Sarah	69 (58–74)	91 (88–96)	93[a] (NA)
		Study 2	
Juan	71 (61–79)	83 (65–90)	88[b] (NA)
Natsu	83 (74–89)	96 (94–99)	92 (87–97)
Cat	69 (63–76)	90 (83–96)	90 (89–92)
Laura	67 (61–76)	82 (67–88)	81 (80–84)

Note.—NA = not applicable.

[a] Student only completed one maintenance session.

[b] Student only completed two maintenance sessions.

Table 2. Scores on Percentage of Correct Word Sequences for Passage-Writing Probes

	Baseline *M* (Range)	Intervention *M* (Range)	Maintenance *M* (Range)
		Study 1	
Scott	54 (38–67)	57 (38–73)	59 (46–74)
Guadalupe	59 (47–69)	68 (53–85)	93[b] (NA)
Sarah	51 (35–68)	61 (48–75)	NA
		Study 2	
Juan	70 (48–80)	92[a] (NA)	NA
Natsu	81 (73–93)	87[a] (NA)	87 (83–92)
Cat	80 (68–90)	88 (84–91)	82 (80–83)
Laura	45 (25–64)	53 (49–64)	55[b] NA

Note.—NA = not applicable.

[a] Student only completed two passage probes during intervention.

[b] Student only completed two passage probes during maintenance.

range of scores across baseline and intervention phases. Finally, only Scott had sufficient maintenance data, which also overlapped substantially with his baseline performance. Results of pre- and posttest assessments for each student are displayed in Table 3. Performance on the sentence combining subtest of the TOWL indicated that all three students demonstrated at-risk sentence-combining skills (i.e., at or below the 25th percentile). Although students were generally low performing on the measure of sentence writing, performance on the essay composition subtest of the WIAT-III indicated that two out of three students had passage-writing skills within the normal range. Performance on the vocabulary assessment indicated that the three children in Study 1 knew very few of the vocabulary words taught as part of the intervention at pretest. Two out of three students improved on the TOWL from pretest to posttest. For knowledge of target vocabulary words, all students knew two more words at posttest than they did at pretest.

Table 3. Raw and Standard Scores for Assessments Administered at Pretest and Posttest

Participant	Sex	Grade	WIAT Pretest (SS)	TOWL Pretest (SS)	TOWL Posttest (SS)	Vocab Pretest	Vocab Posttest
				Study 1			
Scott	M	4	5 (95)	3 (90)	5 (100)	0	2
Guadalupe	F	3	2 (85)	4 (90)	4 (95)[a]	1	3
Sarah	F	3	4 (98)	4 (90)	3 (90)[a]	3	5
				Study 2			
Juan	M	4	5 (95)	6 (95)	NA[b]	8	NA[b]
Natsu	M	4	9 (124)	7 (100)	7 (100)	13	15
Cat	F	5	7 (108)	4 (85)	10 (110)	11	13
Laura	F	4	5 (111)	5 (90)	NA[b]	3	NA[b]

Note.—WIAT = Wechsler Individual Achievement Test essay composition subtest; TOWL = Test of Written Language sentence combining subtest; Vocab = assessment of knowledge of target vocabulary words; SS = standard score; M = male; F = female; NA = not applicable.

[a] Discrepancies in raw and standard scores across pretest and posttest are due to administration of different forms of the TOWL sentence combining subtest at each time point.

[b] Students were missing posttest data because they did not attend posttest sessions and we were unable to follow up with a later assessment session.

Study 2: Method

Participants and Setting

Recruitment procedures were the same as those for Study 1. Informed consent forms were signed and returned for eight additional students. However, pretest scores indicated that four students were high-performing writers (i.e., scored at or above criterion [80% correct] on sentence-combining probes prior to the intervention), and thus they were not included in the analytic sample. Rather than excluding these four students from the study entirely, we took this opportunity to pair each of these four students with one lower-performing student for the intervention, resulting in an instructional dyad (as has been done in prior studies; e.g., see Saddler & Graham, 2005). We did not include the data for the higher-performing students in the analyses. This allowed us to examine whether the sentence-combining approach to teaching adjectives for LM students worked in a small-group instructional context. Consequently, four students in fourth and fifth grades were included in analyses for Study 2, two of whom completed the intervention at the university and two of whom completed the intervention at their normal school facility.

All instructional procedures and materials for Study 2 were the same as those used in Study 1. To ensure that students in instructional dyads did not have reduced opportunities to respond, each student was given an opportunity to respond to questions during modeling and guided practice. In addition to receiving feedback from the instructor, this provided the opportunity for the lower-performing students to listen to how the higher-performing students combined sentences during instruction, providing a peer model. As with Study 1, specific praise and corrective feedback was provided for all student responses, ensuring that students understood why their answers (or the answers of the other student) were correct or incorrect. Students in instructional dyads completed the sentence-combining and passage-writing probes independently.

Among students in Study 2, parent report indicated that Spanish was spoken at home between 76% and 100% of the time for three out of four students. For the remaining student, parent report indicated that Spanish was spoken at home between 26% and 50% of the time. For all students in Study 2, parent report indicated that children preferred to speak English. All students were eligible to receive free or reduced-price lunch.

Procedure and Measures

All measures and study methods were consistent with those used in Study 1, with some small nuanced differences in instruction for the dyads. The instructor began by modeling an example in exactly the same way as in Study 1. For the guided practice examples, the instructor solicited input from both participants in turns, allowing the peers to give each other ideas. This fostered the potential for the target student to learn from the higher-achieving student. During the independent practice, both students were expected to complete the items on their own. The teacher did not provide feedback or allow the students to work together, to keep the integrity of the measure intact. The passage-writing probe was then given to both students. There was no opportunity for the students to interact during the passage-writing assessment.

Study 2: Results

Results for accuracy on the sentence-combining probe in Study 2 are displayed in Figure 3. For students who received instruction in dyads, three of the four students had stable baseline scores after the minimum of five baseline sessions. However, Cat demonstrated improvement during the baseline phase during her fourth and fifth

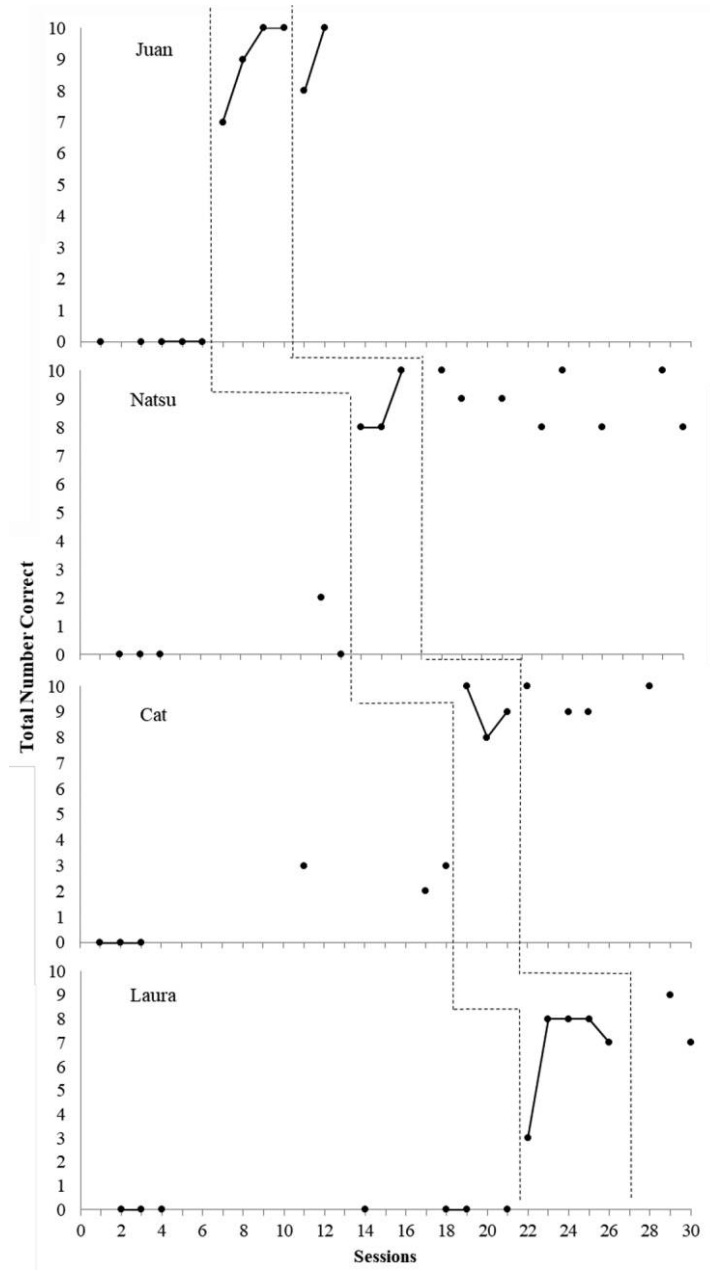


Figure 3. Student performance on sentence-combining probes (accuracy) during baseline, intervention, and maintenance phases for students in Study 2.

sessions. Therefore, a sixth baseline session was obtained to establish a stable level of performance during baseline. Upon introduction to the intervention, all students showed immediate changes in level of accuracy on the sentence-combining probes. Natsu (mean = 8.67, range = 8–10) and Cat (mean = 9, range = 8–10) required the minimum of three intervention sessions to demonstrate mastery of sentence-combining probes; however, Juan (mean = 9, range = 7–10) and Laura (mean = 6.80, range = 3–8) needed four intervention sessions before reaching the preestablished criterion. Available maintenance data indicated that gains made during the intervention phase were maintained after students were no longer receiving explicit sentence-combining instruction. As measures of effect size, we computed the PND, the PAND, and Tau-U. For Study 2, PND and PAND were both 100%, and Tau-U was 1.

For near transfer outcomes (displayed in the lower panel of Table 1 for Study 2), all students showed increased average percentage of correct writing sequences from baseline to intervention, with some overlap in the range of scores for Juan and Laura. Only Natsu and Cat had sufficient maintenance data to determine whether effects were maintained after removal of the intervention. Both students demonstrated strong maintenance effects.

For far transfer (see lower panel of Table 2 for Study 2), the only student who demonstrated a clear change in mean percentage of correct writing sequences on the passage-writing probe from baseline to intervention was Juan; however, this student only completed two passage-writing probes during intervention sessions. Natsu also only had two data points during the intervention phase. Cat and Laura both did not demonstrate differences in mean performance across baseline and intervention phases. Finally, only Natsu and Cat had sufficient data points during the maintenance phase; however, the range of data in maintenance overlapped with baseline data. Taken together, these data indicate that effects of the intervention did not generalize to the passage-writing probe. Performance on the sentence combining subtest of the TOWL indicated that two out of four students demonstrated at-risk sentence-combining skills at pretest; however, all students scored within the normal range on the essay composition subtest of the WIAT-III. Two out of four students knew fewer than 50% of the vocabulary words taught as part of the intervention at pretest. Posttest data were available for only two of the students, one of whom improved on the TOWL from pretest to posttest. Both students knew two more of the target vocabulary words at posttest than they did at pretest.

Discussion

The purpose of this project was to examine (1) whether introduction of explicit sentence-combining instruction led to improvements in LM students' adjective placement in English sentence writing, and (2) whether any effects of sentence-combining instruction extended to curriculum-based measurements (i.e., correct writing sequences). As an exploratory aim of this study, we also evaluated whether students' scores on norm-referenced writing outcomes improved after exposure to the intervention. Overall, results indicated that introduction of explicit sentence-combining instruction was functionally related to improvements in students' ability

to manipulate sentence structure and use adjectives correctly in sentence-combining exercises. This corroborates findings of prior research (e.g., Graham & Perin, 2007; Saddler, Behforooz, et al., 2008) while demonstrating that sentence-combining instruction can be used to enhance the writing abilities of LM students who struggle with basic sentence construction skills. In addition, effects of sentence-combining instruction generalized to improving students' correct writing sequences on simple sentence construction tasks; however, effects of the intervention did not generalize to standardized measures of sentence writing or to students' passage-writing skills. These findings have important implications for practice and future research regarding writing instruction for Spanish-speaking LM students, discussed in the following text.

There were consistent, clear effects of instruction on students' adjective placement. One reason that Spanish-speaking LM students struggle with sentence construction skills may be related to the relations between oral language and writing skills (e.g., Shanahan, 2006). According to the cascading levels of language framework (Berninger et al., 2015), development of writing skills is, in part, dependent on the development of oral language. According to this framework, oral language is necessary for acquisition of both reading and writing skills, as written language represents a codified form of oral language. Prior research indicates that the academic achievement of LM students is directly related to the age at which they attain proficiency in English, with students who do not attain proficiency in English by first grade demonstrating the largest achievement gaps (Halle et al., 2012). Consequently, without early intervention, LM students who have limited oral English proficiency in the early elementary grades may struggle with academic tasks that require use of complex language structures in the late elementary grades, such as writing tasks.

Sentence-combining instruction can assist LM students by reducing the cognitive load required during writing and allowing them to focus on learning specific grammatical rules and applying those rules consistently across multiple practice opportunities (Saddler, 2007). This is supported by theoretical frameworks such as the simple view of writing model (Berninger et al., 2002), according to which children's developing writing skills are constrained by their working memory resources. Instructional approaches to writing that limit demands of working memory may be especially important for LM students who may have limited levels of English proficiency upon which to draw when writing connected text. For example, by providing students with visual representations of kernel sentences, they do not need to hold linguistic information across sentence kernels in memory or place undue emphasis on correct spelling when attempting to combine sentences. This draws working memory and attentional resources away from the language-based demands of writing and allows students to allocate those resources to the specific task at hand, such as manipulation of sentence structure to properly use adjectives to describe nouns.

Effects of explicit sentence-combining instruction also led to improvements in children's use of correct writing sequences on the sentence-combining probe used in this study. Correct writing sequences represent one curriculum-based measurement that is often used by teachers in the context of response-to-intervention models to identify struggling students and make instructional decisions (Prewett et al., 2012). Future research should investigate the extent to which explicit instruction in combining sentences to use adjectives accurately can reduce the prevalence of

students identified as struggling writers due to poor sentence construction skills. This finding may be particularly relevant for students in the early elementary grades, when curriculum-based writing assessments primarily focus on sentence-writing skills (e.g., Coker & Ritchey, 2010). Prior to receiving instruction, students participating in this study often did not include correct punctuation when combining sentences, which led to decreases in students' percentage of correct writing sequences. Furthermore, the number of spelling and grammatical errors was reduced because students were reminded to check their writing against the original kernel sentences for accuracy.

Effects of the sentence-combining intervention did not generalize to improved quality of passage writing in this study. However, there were limitations in our ability to analyze far transfer data, as many students did not have sufficient data points to draw conclusions regarding the far transfer measure; thus, it is possible that our analysis missed some changes in student performance on passage-writing outcomes. For example, prior to intervention Natsu wrote a passage that included 46 total words, with approximately 50% correct word sequences:

> Octopuces lay 100,000 eggs and their ink is blinding. One of the most common tacts is octopuces have 8 tenticles and their octopuses have webbed feet. They are also boneless and their tenticles have saction cups. theyre are alot of diffrent kind af spieces of octopuses.

Following implementation of the intervention, Natsu's passage writing remained similar length overall, but improved to more than 80% correct word sequences:

> Did you know that toucans can only fly short distances with their short wings. They eat mostly fruits but they can eat insect, lizards, and youn birds. A female toucan lays small white eggs. When toucans sleep they tuck their light beak into their black feathers.

In addition to the improvement in correct word sequences across the baseline and intervention passage-writing samples, it was evident that Natsu also increased the number of correctly placed adjectives in his writing. Finally, it is possible that improvements in overall passage-writing quality will take more time to emerge, whereas in this study passage-writing probes were administered immediately following instructional sessions and completion of sentence-combining probes. Future intervention work should include longitudinal follow-ups to determine whether improvements in sentence writing lead to subsequent improvements in passage-writing quality. Although the data were sparse and not consistent enough to draw definitive conclusions with regard to the passage-writing outcomes, with enough practice in sentence writing, students should be able to check their writing for accuracy and improve their connected text-writing skills.

One interesting pattern of findings was that despite poor performance on the sentence-combining probe used in this study, most students in this study had passage-writing skills in the average to above-average range. In fact, pretest scores on the WIAT-III essay composition subtest indicated that only one student scored below the 25th percentile in passage writing, a common cutoff used to determine risk

for learning disabilities (e.g., Foorman et al., 1998). This suggests that despite not being able to accurately combine sentences and manipulate adjective placement within sentences, LM students in this study had substantial knowledge of features of writing to include in a persuasive essay (e.g., topic sentence, reasons and explanations, transition words, concluding sentence). In contrast, five out of seven students in this study scored at or below the 25th percentile on a standardized measure of sentence-writing skills (i.e., the TOWL-IV sentence combining subtest). This pattern of results suggests that LM students have the foundational knowledge of what to include when writing connected text but lack the basic sentence construction skills to produce consistently high-quality writing. One explanation for this pattern may be that students have substantial experiences reading connected text, providing them with strong examples of elements to be included in passage writing, but exposure to differences in grammatical construction across Spanish and English (combined with lack of explicit instruction in sentence construction) may hinder their basic sentence-writing skills. Therefore, explicit instruction targeted toward improving sentence-writing skills may be particularly beneficial for this population of students.

Although the design of this study did not allow for causal inference regarding student performance on the TOWL-IV sentence combining subtest or the vocabulary assessment, we included them as descriptive indicators of student progress from the beginning to the end of the study. Three out of five students for whom posttest data were available improved their performance on the TOWL-IV sentence combining subtest. Our instruction only focused on using sentence-combining instruction to teach appropriate adjective placement and use, whereas the TOWL-IV sentence combining subtest includes items that assess other skills (e.g., forming compound predicates). Interventions that diversify sentence-combining instruction for LM students to teaching other skills may have the potential for improving student performance on standardized measures of sentence writing, among other outcomes (Graham & Hebert, 2011; Graham & Perin, 2007). All students in this study knew two more target vocabulary words at posttest than they did at pretest. Although these gains cannot be attributed to the intervention, a focus on academic vocabulary is particularly important for LM students to obtain content knowledge once academic instruction shifts from learning to read to reading to learn (e.g., August et al., 2016). Sentence-combining instruction may represent one method through which general academic vocabulary can be efficiently delivered to LM students, potentially capitalizing on vocabulary knowledge that students have in their first language when acquiring those words in English.

Limitations

Although this project demonstrated clear, consistent effects of sentence-combining instruction to support the sentence-writing skills of Spanish-speaking LM students, these findings should be considered in the context of several limitations. First, because of the small sample size of these studies, the findings have limited generalizability to other LM students. Although the multiple-probe design used in this study yields high internal validity, external validity for this type of design is weak. Future research should evaluate the effects of sentence-combining instruction for the writing skills of larger samples of LM students using randomized treatment designs.

Second, results of this study did not generalize to students' passage-writing skills. The ability to write high-quality connected text is the ultimate goal of writing instruction. Therefore, it is important to examine how sentence-combining instruction can be embedded within interventions that support students' passage-writing skills to improve all aspects of LM students' writing. Related to generalization is the limitation that this study focused on a very narrow skill (i.e., adjective and adverb placement). Because we used a multiple-probe design for the study, we decided a consistent measure and narrow scope of instruction would work best to illustrate the impacts of the instruction. However, the students learned the skill in a relatively short number of instructional sessions (mean = 4.1). Therefore, it is important to examine the potential impacts of a longer sentence-combining intervention that covers more skills (e.g., writing complex syntactic structures).

Third, because of the design of the study we were unable to determine the relative contribution of different features of the instruction to students' writing outcomes. For example, we were unable to disentangle the effects of explicitly teaching rules of English syntax (e.g., adjective placement) from other features of sentence-combining instruction, such as reducing the working memory load placed on students while writing. The lack of improvement in correct word sequences on the passage-writing probe suggests that improvements in correct word sequences were primarily attributable to reducing the working memory load on students. However, future studies should administer sentence-combining or sentence construction probes for which students do not have access to visual representations of the stimuli. Such a measure would allow for examination of whether the explicit instruction in English syntax leads to improvements in sentence-writing skills in the absence of reduced cognitive load.

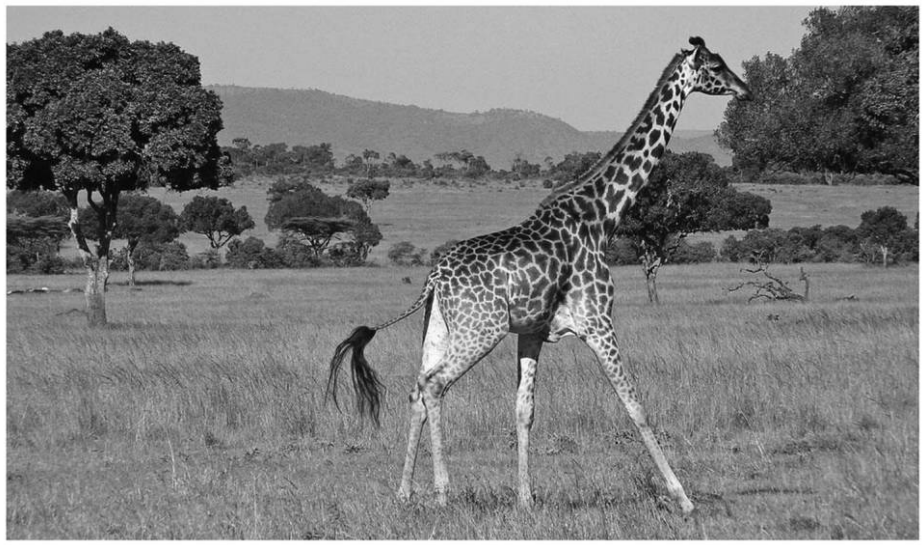
Finally, performance on standardized passage-writing measures suggested that these students did not have substantial writing difficulties. Future studies should examine the effectiveness of sentence-combining instruction for LM students with more severe writing difficulties. It is possible that basic sentence-combining instruction may improve the passage-writing skills of students with large deficits in passage writing, but we were unable to observe these effects in this study.

Conclusion

Despite these limitations, the overall pattern of results in this study suggests that sentence-combining instruction is effective for improving the writing skills of Spanish-speaking LM students. These findings have direct implications for classroom instruction, as this instruction is easy to implement and adapt to teach a wide variety of skills. Furthermore, teachers can give one-to-one support to struggling students or choose to group students together when working on writing instruction. Sentence-combining materials are easy to develop and are applicable across practically all content areas. We have provided specific examples of student workbooks and teacher scripts in the Appendix for this article that teachers can use to develop their own sentence-combining exercises within a given content area. Given the importance of writing skills for success throughout school and life, future research should continue to evaluate how sentence-combining instruction can be most efficiently utilized to improve writing outcomes for LM students.

Appendix

Today's Topic: Giraffes



Vocabulary for Giraffes

Arid: very dry
The desert is arid.
The Spanish word for **arid** is **árido(a)**.

Elongated: unusually long or stretched out
Frogs have elongated tongues.
The Spanish word for **elongated** is **alongado(a)**.

Towering: very tall
The buildings are towering.
The Spanish word for **towering** is **altísimo(a)**.

1. Giraffes can go without water during the dry season in the savanna.
   The savanna is arid during the dry season.
   Giraffes can go without water during the dry season in the _____ savanna.

2. Giraffes' necks and good eyesight help them to keep watch over their herd.
   Giraffes' necks are elongated.
   A giraffe's _____ neck and good eyesight help it to keep watch over its herd.

3. Giraffes are the tallest mammals in the world because of their legs and necks.
   Their legs are towering.

Their necks are long.
Giraffes are the tallest mammals in the world because of their _____ legs and _____ necks.

4. Giraffes have good eyesight so they can spot predators from far away.
The predators are stealthy.

_____
_____

5. A giraffe gets a lot of water from the plants it eats.
The plants are luscious.

_____
_____

6. Giraffes' necks and tongues help them eat leaves off tall trees.
Their necks are lanky.
Their tongues are long.

_____
_____

7. Giraffes have to stretch and bend their necks to drink water from the ground.
The water is refreshing.
Their necks are lengthy.

_____
_____

8. Giraffes use their tongues to help them to pull leaves from trees.
The trees are towering.
Their tongues are long.

_____
_____

9. Giraffes eat evergreens in the savanna during the dry season.
The savanna is arid during the dry season.

_____
_____

10. Giraffes live in grasslands called savannas.
The grasslands are sparse.

_____
_____

11. Giraffes' spots help to protect their skin from the sun.
Their skin is sensitive.
The sun is hot.

_____
_____

12. Giraffes have spotted fur coats.
The spotted fur coats are unique.

_____
_____

13. Giraffes have eyelashes to help keep insects out of their eyes.
Their eyelashes are elongated.

_____
_____

14. All giraffes have horns called ossicones.
The horns are hair-covered.

_____
_____

15. Giraffes' feet are 12 inches across.
Their feet are wide.

_____
_____

16. A giraffe gives birth while standing up, and the babies fall down to the ground.
The ground is dirty.

_____
_____

Lesson: Giraffes

Communicate (Lesson Goal). *The goal of this lesson is to learn how to combine sentences to make our writing more descriptive. Today, we will combine sentences while we read about giraffes. Let's open to the first page and look at the vocabulary on page 1 (hereafter, appendix page citations refer to pages in the lesson packets used for tutoring).*

Discuss. *Today we are focusing on three adjectives that will help us create more descriptive sentences. Today's words are "arid," "elongated," and "towering."*

***Arid** means very dry.*
The air is arid in the desert.
*The Spanish word for arid is **árido or árida / seco or seca**.*

***Elongated** means unusually long or stretched out.*
The plant elongated its stem to get more sunlight.
*The Spanish word for elongated is **alargado o alargada / alongado or alongada**.*

***Towering** means very tall.*
The tall buildings are towering over us.
*The Spanish word for towering is **elevado or elevada / altísimo or altísima**.*

Instructions. *Now look at Exercise 1 on page 2. I am going to show you how to combine sentences to make a more complex sentence.*

Think-Aloud. *The first things I notice are two sentences. I am going to read these sentences. Point to the first sentence and read silently while I read it aloud.*

Read. Teacher reads the first set of sentences about giraffes aloud.

Think-Aloud. Say:

Point to the first sentence. The first sentence tells me that giraffes can go without water in the savanna during the dry season. The second sentence tells me that the savanna is arid during the dry season. Find the word "arid." I think I can move the word "arid" to the first sentence, and I don't need the words in the rest of the second sentence anymore. I am going to do it like this.

(say sentence aloud):

Giraffes can go without water during the arid season in the savanna.

I think that sounds good. The word "arid" describes the season, and I used all of the information from the two sentences. Now I need to write the new sentence.

Write. (Say each word out loud while writing.) When you get to the word "arid," say:

I don't know how to spell this word. I can look at back at how it is spelled in the original sentences.

Once the instructor has finished writing the sentence, say:

That sounds great! There are some words I didn't have to repeat because they were already in the first sentence. I combined the sentences by moving the adjective "arid" to the first sentence. I put the adjective "arid" in front of savanna because it's describing the savanna, and then I wrote my new sentence.

Instruct. *Now it's your turn. Fill in the blank space with the missing word from our new sentence.*

Instructions. *Now look at Exercise 2 on page 2.*

Think-Aloud. *I notice that there are two sentences. I am going to read these sentences. Point to the first sentence and remember to read silently while I read it aloud.*

Read. Teacher reads the second set of sentences about giraffes aloud.

Think-Aloud. Say:

The first sentence tells me that giraffes' necks and good eyesight help them watch over their herd. Find the word "neck." The second sentence tells me their necks are elongated. Find the word "elongated." I think I can move the word "elongated" to the first sentence, and I don't need the words in the rest of the second sentence anymore. I am going to do it like this.

(say sentence aloud):

A giraffe's elongated neck and good eyesight help it to keep watch over its herd.

That sounds good to me. The word "elongated" describes their neck, and I used all of the information from the two sentences. Now I need to write the new sentence.

Write. (Say each word out loud while writing.) When you get to the word "elongated," say:

I am not sure how to spell this word, but I think I could sound it out. I can always look back at the original sentences to check my spelling.

Once the instructor has finished writing the sentence, say:

That sounds good! There are some words I didn't have to repeat because they were already in the first sentence. I combined the sentences by moving the adjective "elongated" to the first sentence. I put the adjective "elongated" in front of neck because it is describing their neck, and then I wrote my new sentence.

Instruct. *Now it's your turn. Fill in the blank space with the missing adjective.*

Instructions. *Now look at Exercise 3 on page 2.*

Think-Aloud. *The first thing I notice is that there are three sentences. I still have to combine them into one sentence. I have to focus a little harder on this one because I have to remember to include all of the information in the sentences. I am going to read these sentences. Point to the first sentence and read silently while I read it aloud.*

Read. Teacher reads the third set of sentences about giraffes aloud.

Think-Aloud. Say:

The first sentence tells me that giraffes' legs and necks make them the tallest mammals in the world. The second sentence tells me that their legs are towering. Find the word "towering." And the third sentence tells me that their necks are long. Find the word "long." I think I can move the words "towering" and "long" to the first sentence, and I don't need the words in the rest of the sentences anymore. I am going to do it like this.

(say sentence aloud):

Giraffes are the tallest mammals in the world because of their towering legs and long necks.

I like how that sounds. The word "towering" describes their legs, and "long" describes their necks. I used all of the information from the three sentences. Now I need to write the new sentence.

Write. (Say each word out loud while writing.) When you get to the word "towering," say:

I am not sure how to spell this word, but I think I could sound it out. I can always double-check my spelling by looking back at the original sentences.

Instruct. *Now it's your turn. Fill in the blank space with the missing word from our new sentence.*

Transition to guided practice

Communicate. *Now we are going to do some exercises together. We will talk about how to combine sentences, and we will write the new sentence together. Turn to page 4 and find Exercise 4.*

Ask (Question). *Take a look at the sentences you'll be combining. How many are there? (2)*

Instruct. Say:

Point to the first sentence and follow along as I read.

The teacher reads both sentences, and the students echo read after the teacher has finished.

Communicate. *The first sentence tells me that giraffes can spot predators from far away. What does the second sentence tell you about the predators? How can we combine these sentences to make a more descriptive sentence?*

(Discuss how to combine the sentences; refer to the flowchart.)

- If correctly combined: provide specific praise

    1. Example: *That's correct! Predators are stealthy and giraffes can spot them from far away. "Stealthy" is the adjective that describes the predators.*

- If incorrectly combined or not combined: provide available prompts

    1. Use secondary prompting
    2. Remodel
    3. Redo
    4. Praise

- If unable to combine even with prompting, say:

Our sentence could sound like this: ***Giraffes have good eyesight so they can spot stealthy predators from far away.***

Write

- If a student comes up with their own sentence

    - Say: *You can write the sentence you came up with on the lines below, and if you need help spelling a word, you can look back at the original sentences.*

- If not:

    - Say: *Now we'll write the new sentence on the line below.* (Use the teacher sentence and say each word out loud while writing.)

When you get to the word "stealthy," say:

I don't know how to spell this word, but I can always look back at original sentences to help me.

That looks great! The word "stealthy" describes the predators, and we used all of the information from both sentences.

Instruct. *Now look at Exercise 5 on page 4.*

Ask (Question). *Think about how many sentences there are. How many will you be combining? (2)*

Instruct. Say:

Point to the first sentence and follow along as I read.

The teacher reads all three sentences, and the students echo read after the teacher has finished.

Communicate. *The first sentence tells me that giraffes get a lot of water from the plants they eat. What does the second sentence tell you about the plants? How can we combine these sentences to make a more descriptive sentence?*

(Discuss how to combine the sentences; refer to the flowchart.)

- If correctly combined: provide specific praise

    1. Example: *That's correct! Giraffes get a lot of water from luscious plants. "Luscious" is the adjective used to describe the plants.*

- If incorrectly combined or not combined: provide available prompts

    1. Use secondary prompting
    2. Remodel
    3. Redo
    4. Praise

- If unable to combine even with prompting, say:

Our sentence could sound like this: ***A giraffe gets a lot of water from the luscious plants it eats.***

Write

- If a student comes up with their own sentence

    - Say: *You can write the sentence you came up with on the lines below, and if you need help spelling a word, you can look back at the old sentences.*

- If not:

    - Say: *Now we'll write the new sentence on the line below*. Use the teacher sentence, and say each word out loud while writing.

When you get to the word "luscious," say:

I don't know how to spell this word, but I can always look back at the original sentences to help me.

That sounds good to me! The word "luscious" describes the plants, and we used all the information from both sentences.

Instruct. *Now look at Exercise 6.*

Ask (Question). *Take a look at the sentences you'll be combining. How many are there? (3)*

Instruct. Say:

Point to the first sentence and follow along as I read.

The teacher reads all three sentences and the students echo read after the teacher has finished.

Communicate. *The first sentence tells me that giraffes use their necks and tongues to help them eat leaves off tall trees. What does the second sentence tell you about their necks? What does the third sentence tell you about their tongues? How can we combine these sentences to make a more descriptive sentence?*

(Discuss how to combine the sentences; refer to the flowchart.)

- If correctly combined: provide specific praise

    1. Example: *That's correct! Giraffes' lanky necks and long tongues help them eat leaves off tall trees. "Lanky" is the adjective used to describe their necks, and "long" is the adjective used to describe their tongues.*

- If incorrectly combined or not combined: provide available prompts

    5. Use secondary prompting
    6. Remodel
    7. Redo
    8. Praise

- If unable to combine even with prompting, say:

Our sentence could sound like this: Giraffes' lanky necks and long tongues help them eat leaves off tall trees.

Write

- If a student comes up with their own sentence
  - Say: *You can write the sentence you came up with on the lines below, and if you need help spelling a word, you can look back at the old sentences.*

- If not:
  - Say: *Now we'll write the new sentence on the line below*. Use the teacher sentence, and say each word out loud while writing.

When you get to the word "lanky," say:

I don't know how to spell this word, but I can always look back at the original sentences to help me.

That sounds good to me. The word "lanky" describes their necks, and the word "long" describes their tongues. We used all of the information from the both sentences.

Practice: Independent

Communicate. *Now you are going to do some exercises on your own. Think about how to combine the sentences to make them more descriptive, and remember, if you do not know how to spell a word, you can look back at the original sentences. Turn your page to the independent practice section and begin. I'll be here to help you, but I would like to see what you can do on your own. If you're not sure about a sentence, go to the next one and come back to it later.*

Note

J. Marc Goodrich is assistant professor of special education at the University of Nebraska–Lincoln; Michael Hebert is associate professor of special education at the University of Nebraska–Lincoln; Mackenzie Savaiano is assistant professor of practice of special education at the University of Nebraska–Lincoln; Tim T. Andress is currently an elementary school teacher at the Fremont Public Schools located in Fremont, NE. Correspondence may be sent to J. Marc Goodrich at jgoodrich4@unl.edu.

References

Amato, J. M., & Watkins, M. W. (2011). The predictive validity of CBM writing indices for eighth-grade students. *Journal of Special Education*, **44**, 195–204.

Aud, S., Fox, M. A., & KewalRamani, A. (2010). *Status and trends in the education of racial and ethnic groups* (NCES 2010-015). US Department of Education, National Center for Education Statistics.

August, D., Artzi, L., & Barr, C. (2016). Helping ELLs meet standards in English language arts and science: An intervention focused on academic vocabulary. *Reading and Writing Quarterly*, **32**, 373–396. https://doi.org/10.1080/10573569.2015.1039738

August, D., Carlo, M., Dressler, C., & Snow, C. (2005). The critical role of vocabulary development for English language learners. *Learning Disabilities Research and Practice*, **20**, 50–57. https://doi.org/10.1111/j.1540-5826.2005.00120.x

Bauman, K. (2017, August 28). *School enrollment of the Hispanic population: Two decades of growth*. https://www.census.gov

Berninger, V. W., Richards, T. L., & Abbott, R. D. (2015). Differential diagnosis of dysgraphia, dyslexia, and OWL LD: Behavioral and neuroimaging evidence. *Reading and Writing*, **28**, 1119–1153.

Berninger, V. W., Vaughan, K., Abbott, R. D., Begay, K., Coleman, K. B., Curtin, G., Hawkins, J. M., & Graham, S. (2002). Teaching spelling and composition alone and together: Implications for the simple view of writing. *Journal of Educational Psychology*, **94**, 291–304. https://doi.org/10.1037/0022-0663.94.2.291

Breaux, K. C. (2010). *Wechsler Individual Achievement Test—Third edition: Technical manual*. Pearson.

Coker, D. L., & Ritchey, K. D. (2010). Curriculum-based measurement of writing in kindergarten and first grade: An investigation of production and qualitative scores. *Exceptional Children*, **76**, 175–193. https://doi.org/10.1177/001440291007600203

Datchuk, S. M., Wagner, K., & Hier, B. O. (2019). Level and trend of writing sequences: A review and meta-analysis of writing interventions for students with disabilities. *Exceptional Children*, 1–19. Advance online publication.

Escamilla, K. (2006). Semilingualism applied to the literacy behaviors of Spanish-speaking emerging bilinguals: Bi-illiteracy or emerging biliteracy? *Teachers College Record*, **108**, 2329–2353.

Figueredo, L. (2006). Using the known to chart the unknown: A review of first-language influence on the development of English-as-a-second-language spelling skill. *Reading and Writing*, **19**, 873–905. https://doi.org/10.1007/s11145-006-9014-1

Foorman, B. R., Francis, D. J., Fletcher, J. M., Schatschneider, C., & Mehta, P. (1998). The role of instruction in learning to read: Preventing reading failure in at-risk children. *Journal of Educational Psychology*, **90**, 37–55. https://doi.org/10.1037/0022-0663.90.1.37

Gansle, K. A., Noell, G. H., VanDerHeyden, A. M., Naquin, G. M., & Slider, N. J. (2002). Moving beyond total words written: The reliability, criterion validity, and time cost of alternate measures for curriculum-based measurement in writing. *School Psychology Review*, **31**, 477–497.

Gomez, R., Parker, R., Lara-Alecio, R., & Gomez, L. (1996). Process versus product writing with limited English proficient students. *Bilingual Research Journal*, **20**, 209–233. https://doi.org/10.1080/15235882.1996.10668628

Graham, S. (1997). Executive control in the revising of students with learning and writing difficulties. *Journal of Educational Psychology*, **89**, 223–234.

Graham, S., Harris, K., & Hebert, M. (2011). *Informing writing: The benefits of formative assessment*. Carnegie.

Graham, S., & Hebert, M. (2010). *Writing to read: Evidence for how writing can improve reading*. Washington, DC: Alliance for Excellent Education.

Graham, S., & Hebert, M. (2011). Writing to read: A meta-analysis of the impact of writing and writing instruction on reading. *Harvard Educational Review*, **81**, 710–744. https://doi.org/10.17763/haer.81.4.t2kom13756113566

Graham, S., & Perin, D. (2007). A meta-analysis of writing instruction for adolescent students. *Journal of Educational Psychology*, **99**(3), 445–476. https://doi.org/10.1037/0022-0663.99.3.445

Halle, T., Hair, E., Wandner, L., McNamara, M., & Chien, N. (2012). Predictors and outcomes of early versus later English language proficiency among English language learners. *Early Childhood Research Quarterly*, **27**, 1–20. https://doi.org/10.1016/j.ecresq.2011.07.004

Hammil, D. D., & Larson, S. C. (2009). *Test of written language* (4th ed.). Pro-Ed.

Hoff, E. (2013). Interpreting the early language trajectories of children from low-SES and language minority homes: Implications for closing achievement gaps. *Developmental Psychology*, **49**, 4–14. https://doi.org/10.1037/a0027238

Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baseline. *Journal of Applied Behavior Analysis*, **11**, 189–196. https://doi.org/10.1901/jaba.1978.11-189

Huie, K., & Yahya, N. (2011). Learning to write in the primary grades: Experiences of English language learners and mainstream students. *TESOL Journal*, **12**, 25–31. https://doi.org/10.1002/j.1949-3533.2003.tb00116.x

Keller-Margulis, M., Payan, A., Jaspers, K. E., & Brewton, C. (2015). Validity and diagnostic accuracy of written expression curriculum-based measurement for students with diverse language backgrounds. *Reading and Writing Quarterly*, **32**, 174–198.

Kieffer, M. J. (2008). Catching up or falling behind? Initial English proficiency, concentrated poverty, and the reading growth of language minority learners in the United States. *Journal of Educational Psychology*, **100**, 851–868. https://doi.org/10.1037/0022-0663.100.4.851

Kieffer, M. J. (2011). Converging trajectories: Reading growth in language minority learners and their classmates, kindergarten to grade 8. *American Educational Research Journal*, **48**, 1187–1225. https://doi.org/10.3102/0002831211419490

Kratochwill, T. R., Hitchcock, J. H., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2013). Single-case intervention research design standards. *Remedial and Special Education*, **34**, 26–38. https://doi.org/10.1177/0741932512452794

Maehler, C., & Schuchardt, K. (2016). Working memory in children with specific learning disorders and/or attention deficits. *Learning and Individual Differences*, **49**, 341–347.

McMaster, K. L., Du, X., & Pétursdóttir, A.-L. (2009). Technical features of curriculum-based measures for beginning writers. *Journal of Learning Disabilities*, **42**, 41–60.

Merriam-Webster. (n.d.-a). *Merriam-Webster's Learner's Dictionary*. Retrieved January 2018 from https://www.learnersdictionary.com

Merriam-Webster. (n.d.-b). *Merriam-Webster's Word Central*. Retrieved January 2018 from https://www.wordcentral.com

National Center for Education Statistics. (2011). *NAEP data explorer*. https://www.nationsreportcard.gov

Perin, D., De la Paz, S., Piantedosi, K. W., & Peercy, M. M. (2017). The writing of language minority students: A literature review on its relation to oral proficiency. *Reading and Writing Quarterly*, **33**, 465–483. https://doi.org/10.1080/10573569.2016.1247399

Prater, D., & Bermudez, A. (1993). Using peer response groups with limited English proficient writers. *Bilingual Research Journal*, **17**, 99–116. https://doi.org/10.1080/15235882.1993.10162650

Prewett, S., Mellard, D. F., Deshler, D. D., Allen, J., Alexander, R., & Stern, A. (2012). Response to intervention in middle schools: Practices and outcomes. *Learning Disabilities Research and Practice*, **27**, 136–147. https://doi.org/10.1111/j.1540-5826.2012.00359.x

Psychological Corporation. (2009). *Wechsler individual achievement test* (3rd ed.).

Rogers, L. A., & Graham, S. (2008). A meta-analysis of single subject design writing intervention research. *Journal of Educational Psychology*, **100**, 879–906. https://doi.org/10.1037/0022-0663.100.4.879

Romig, J. E., Therrien, W. J., & Lloyd, J. W. (2017). Meta-analysis of criterion validity for curriculum-based measurement in written language. *Journal of Special Education*, **51**, 72–82.

Saddler, B. (2007). Improving sentence construction skills through sentence-combining practice. In S. Graham, C. A. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction*. Guilford.

Saddler, B., Asaro, K., & Behforooz, B. (2008). The effects of peer-assisted sentence-combining practice on four young writers with learning disabilities. *Learning Disabilities: A Contemporary Journal*, **6**, 17–31.

Saddler, B., Behforooz, B., & Asaro, K. (2008). The effects of sentence-combining instruction on the writing of fourth-grade students with writing difficulties. *Journal of Special Education*, **42**, 79–90. https://doi.org/10.1177/0022466907310371

Saddler, B., Ellis-Robinson, T., & Asaro-Saddler, K. (2018). Using sentence combining instruction to enhance the writing skills of children with learning disabilities. *Learning Disabilities: A Contemporary Journal*, **16**, 191–202.

Saddler, B., & Graham, S. (2005). The effects of peer-assisted sentence-combining instruction on the writing performance of more and less skilled young writers. *Journal of Educational Psychology*, **97**, 43–54. https://doi.org/10.1037/0022-0663.97.1.43

Shanahan, T. (2006). Relations among oral language, reading, and writing development. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research*. Guilford.

Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental Psychology*, **38**, 934–947. https://doi.org/10.1037/0012-1649.38.6.934

US Census Bureau. (2017, August 31). *Facts for features: Hispanic heritage month 2017*. https://www.census.gov

Viel-Ruma, K., Houchins, D. E., Jolivette, K., Fredrick, L. D., & Gama, R. (2010). Direct instruction in written expression: The effects on English speakers and English language learners with disabilities. *Learning Disabilities Research and Practice*, **25**, 97–108. https://doi.org/10.1111/j.1540-5826.2010.00307.x